

SMS BASED VALUE ADDED SERVICES WITH THE HELP OF GPS

Prepared By

**Md. Shahenoor Rahman
Student ID: 02101042**

**Shaba Shams
Student ID: 02101002**

**Mohammad Sofiquul Islam
Student ID: 02101085**

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ABSTRACT

In Bangladesh we have five mobile telecommunication companies, among all only two of them have GPRS system and near future they will bring GPS system. This is why we want to develop a system that will work with GPS and help people to get information about school, college, hospital, hotel, police station and others in an area. Now a day those mobile companies are giving some SMS (Short Message Service) services like the result of games, transports like bus, train, plane arrival and departure time. But they have to think about what if someone needs some information about hospital or school or hotel list of any city or an area. By using GPS system we can track the person who need help and give the desired information. We want to work on that as our thesis topic and need your help as a Supervisor that will bring us the success.

DECLARATION

I, Md. Shahenoor Rahman, University ID: - 02101042 have completed some of the modules of our proposed Thesis, SMS based Value added Service with the help of GPS, Under CSE 400 course based on the result found by me.

I therefore declare that this project has been published previously neither in whole nor in part of any degree except this publication.

Signature of
Supervisor

Signature of
Authors'

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Firstly, I'm grateful to almighty Allah for providing the strength and energy to start such a project and finally finish it successfully.

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CHAPTER 1

INTRODUCTION

New era is of technology and communication so it is very common that people would use new gadgets a lot to make their life more informative and communicative and comfortable.

One of the modern technology that is being used by most people vastly in the whole world as well as in our country as important equipment to gather information is mobile phone. People are using mobile phone like a part of their hand.

In our country the telecommunication system has gone so far, we have TNT land line department owned and run by government, we have four GSM cellular service corporations and one CDMA telecommunication service. They gives us not only to communicate to each other but also other services like news, sports live results, weather news etc. by the service named “SMS” (short message service).

But some time we need the information about our area like how many schools there are in our area or some time we need the nearest hospital but we don't know the area then what shall we do? What If our mobile phone can help us about this subject?

But it is hard to track the subscriber, that's why we use the GPS (global positioning system) to get the GIS code to track the subscriber to locate the area and by SMS because they can read it and they can use it later.

1.1 Some important things about GPS

The Global Positioning System (GPS) is a worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations.

GPS uses these "man-made stars" as reference points to calculate positions accurate to a matter of meters. In fact, with advanced forms of GPS you can make measurements to better than a centimeter!

In a sense it's like giving every square meter on the planet a unique address.

GPS receivers have been miniaturized to just a few integrated circuits and so are becoming very economical. And that makes the technology accessible to virtually everyone.

These days GPS is finding its way into cars, boats, planes, construction equipment, movie making gear, farm machinery, even laptop computers.

Soon GPS will become almost as basic as the telephone. Indeed, at Trimble, we think it just may become a universal utility.

Here's how GPS works in five logical steps:

1. The basis of GPS is "triangulation" from satellites.
2. To "triangulate," a GPS receiver measures distance using the travel time of radio signals.
3. To measure travel time, GPS needs very accurate timing which it achieves with some tricks.

4. Along with distance, you need to know exactly where the satellites are in space. High orbits and careful monitoring are the secret.
5. Finally you must correct for any delays the signal experiences as it travels through the atmosphere.

We'll explain each of these points in the next five sections of the tutorial. We recommend you follow the tutorial in order. Remember, science is a step-by-step discipline!

Step1. Triangulating from satellite

Improbable as it may seem, the whole idea behind GPS is to use satellites in space as reference points for locations here on earth.

That's right, by very, very accurately measuring our distance from three satellites we can "triangulate" our position anywhere on earth.

Forget for a moment how our receiver measures this distance. We'll get to that later. First consider how distance measurements from three satellites can pinpoint you in space.

Geometrically:

Suppose we measure our distance from a satellite and find it to be 11,000 miles.

Knowing that we're 11,000 miles from a particular satellite narrows down all the possible locations we could be in the whole universe to the surface of a sphere that is centered on this satellite and has a radius of 11,000 miles.

Next, say we measure our distance to a second satellite and find out that it's 12,000 miles away.

That tells us that we're not only on the first sphere but we're also on a sphere that's 12,000 miles from the second satellite. Or in other words, we're somewhere on the circle where these two spheres intersect.

If we then make a measurement from a third satellite and find that we're 13,000 miles from that one, that narrows our position down even further, to the two points where the 13,000 mile sphere cuts through the circle that's the intersection of the first two spheres.

So by ranging from three satellites we can narrow our position to just two points in space.

To decide which one is our true location we could make a fourth measurement. But usually one of the two points is a ridiculous answer (either too far from Earth or moving at an impossible velocity) and can be rejected without a measurement.

A fourth measurement does come in very handy for another reason however, but we'll tell you about that later.

Next we'll see how the system measures distances to satellites.

Triangulating in short:

- Position is calculated from distance measurements (ranges) to satellites.
- Mathematically we need four satellite ranges to determine exact position.
- Three ranges are enough if we reject ridiculous answers or use other tricks.
- Another range is required for technical reasons to be discussed later.

Step2. Measuring distance from a satellite

We saw in the last section that a position is calculated from distance measurements to at least three satellites.

But how can you measure the distance to something that's floating around in space? We do it by timing how long it takes for a signal sent from the satellite to arrive at our receiver

Mathematically:

In a sense, the whole thing boils down to those "velocity times travel time" math problems we did in high school. Remember the old: "If a car goes 60 miles per hour for two hours, how far does it travel?"

$$\text{Velocity (60 mph) x Time (2 hours) = Distance (120 miles)}$$

In the case of GPS we're measuring a radio signal so the velocity is going to be the speed of light or roughly 186,000 miles per second.

The problem is measuring the travel time.

The timing problem is tricky. First, the times are going to be awfully short. If a satellite were right overhead the travel time would be something like 0.06 seconds. So we're going to need some really precise clocks. We'll talk about those soon.

But assuming we have precise clocks, how do we measure travel time? To explain it let's use a goofy analogy:

Suppose there was a way to get both the satellite and the receiver to start playing "The Star Spangled Banner" at precisely 12 noon. If sound could reach us from space (which, of course, is ridiculous) then standing at the receiver we'd hear two versions of the Star Spangled Banner, one from our receiver and one from the satellite.

These two versions would be out of sync. The version coming from the satellite would be a little delayed because it had to travel more than 11,000 miles.

If we wanted to see just how delayed the satellite's version was, we could start delaying the receiver's version until they fell into perfect sync.

The amount we have to shift back the receiver's version is equal to the travel time of the satellite's version. So we just multiply that time times the speed of light and BINGO! we've got our distance to the satellite.

That's basically how GPS works.

Only instead of the Star Spangled Banner the satellites and receivers use something called a "Pseudo Random Code" - which is probably easier to sing than the Star Spangled Banner

A Random Code

The Pseudo Random Code (PRC, shown above) is a fundamental part of GPS. Physically it's just a very complicated digital code, or in other words, a complicated sequence of "on" and "off" pulses as shown here:

The signal is so complicated that it almost looks like random electrical noise. Hence the name "Pseudo-Random."

There are several good reasons for that complexity: First, the complex pattern helps make sure that the receiver doesn't accidentally sync up to some other

signal. The patterns are so complex that it's highly unlikely that a stray signal will have exactly the same shape.

Since each satellite has its own unique Pseudo-Random Code this complexity also guarantees that the receiver won't accidentally pick up another satellite's signal. So all the satellites can use the same frequency without jamming each other. And it makes it more difficult for a hostile force to jam the system. In fact the Pseudo Random Code gives the DOD a way to control access to the system.

But there's another reason for the complexity of the Pseudo Random Code, a reason that's crucial to making GPS economical. The codes make it possible to use "information theory" to "amplify" the GPS signal. And that's why GPS receivers don't need big satellite dishes to receive the GPS signals.

We glossed over one point in our goofy Star-Spangled Banner analogy. It assumes that we can guarantee that both the satellite and the receiver start generating their codes at exactly the same time. But *how* do we make sure everybody is perfectly synced? Stay tuned and see.

Measuring Distance:

1. Distance to a satellite is determined by measuring how long a radio signal takes to reach us from that satellite.
2. To make the measurement we assume that both the satellite and our receiver are generating the same pseudo-random codes at exactly the same time.
3. By comparing how late the satellite's pseudo-random code appears compared to our receiver's code, we determine how long it took to reach us.
4. Multiply that travel time by the speed of light and you've got distance.

Step 3. Getting perfect timing

If measuring the travel time of a radio signal is the key to GPS, then our stop watches had better be darn good, because if their timing is off by just a thousandth of a second, at the speed of light, that translates into almost 200 miles of error!

On the satellite side, timing is almost perfect because they have incredibly precise atomic clocks on board.

But what about our receivers here on the ground?

Remember that both the satellite and the receiver need to be able to precisely synchronize their pseudo-random codes to make the system work.

If our receivers needed atomic clocks (which cost upwards of \$50K to \$100K) GPS would be a lame duck technology. Nobody could afford it.

Luckily the designers of GPS came up with a brilliant little trick that lets us get by with much less accurate clocks in our receivers. This trick is one of the key elements of GPS and as an added side benefit it means that every GPS receiver is essentially an atomic-accuracy clock.

The secret to perfect timing is to make an *extra* satellite measurement.

That's right, if three perfect measurements can locate a point in 3-dimensional space, then four *imperfect* measurements can do the same thing.

Extra Measurement Cures Timing Offset

If our receiver's clocks were perfect, then all our satellite ranges would intersect at a single point (which is our position). But with imperfect clocks, a fourth measurement, done as a cross-check, will NOT intersect with the first three.

So the receiver's computer says "Uh-oh! there is a discrepancy in my measurements. I must not be perfectly synced with universal time."

Since any offset from universal time will affect all of our measurements, the receiver looks for a single correction factor that it can subtract from all its timing measurements that would cause them all to intersect at a single point.

That correction brings the receiver's clock back into sync with universal time, and bingo! - you've got atomic accuracy time right in the palm of your hand.

Once it has that correction it applies to all the rest of its measurements and now we've got precise positioning.

One consequence of this principle is that any decent GPS receiver will need to have at least four channels so that it can make the four measurements simultaneously.

With the pseudo-random code as a rock solid timing sync pulse, and this extra measurement trick to get us perfectly synced to universal time, we have got everything we need to measure our distance to a satellite in space.

But for the triangulation to work we not only need to know distance, we also need to know exactly where the satellites are.

In the next section we'll see how we accomplish that.

Getting Perfect Timing:

1. Accurate timing is the key to measuring distance to satellites.
2. Satellites are accurate because they have atomic clocks on board.
3. Receiver clocks don't have to be too accurate because an extra satellite range measurement can remove errors.

In this tutorial we've been assuming that we know where the GPS satellites are so we can use them as reference points.

But how do we know *exactly* where they are? After all they're floating around 11,000 miles up in space.

Step 4. Knowing where a satellite is in space

A high satellite gathers no moss

That 11,000 mile altitude is actually a benefit in this case, because something that high is well clear of the atmosphere. And that means it will orbit according to very simple mathematics.

The Air Force has injected each GPS satellite into a very precise orbit, according to the GPS master plan.

On the ground all GPS receivers have an almanac programmed into their computers that tells them where in the sky each satellite is, moment by moment.

The basic orbits are quite exact but just to make things perfect the GPS satellites are constantly monitored by the Department of Defense.

They use very precise radar to check each satellite's exact altitude, position and speed.

The errors they're checking for are called "ephemeris errors" because they affect the satellite's orbit or "ephemeris." These errors are caused by gravitational pulls from the moon and sun and by the pressure of solar radiation on the satellites.

The errors are usually very slight but if you want great accuracy they must be taken into account.

Getting the message out

Once the DOD has measured a satellite's exact position, they relay that information back up to the satellite itself. The satellite then includes this new corrected position information in the timing signals it's broadcasting.

So a GPS signal is more than just pseudo-random code for timing purposes. It also contains a navigation message with ephemeris information as well.

With perfect timing and the satellite's exact position you'd think we'd be ready to make perfect position calculations. But there's trouble afoot. Check out the next section to see what's up.

Satellite Positions:

- To use the satellites as references for range measurements we need to know exactly where they are.
- GPS satellites are so high up their orbits are very predictable.
- Minor variations in their orbits are measured by the Department of Defense.

- The error information is sent to the satellites, to be transmitted along with the timing signals.

Step 5. Correcting errors

Up to now we've been treating the calculations that go into GPS very abstractly, as if the whole thing were happening in a vacuum. But in the real world there are lots of things that can happen to a GPS signal that will make its life less than mathematically perfect.

To get the most out of the system, a good GPS receiver needs to take a wide variety of possible errors into account. Here's what they've got to deal with.

First, one of the basic assumptions we've been using throughout this tutorial is not exactly true. We've been saying that you calculate distance to a satellite by multiplying a signal's travel time by the speed of light. But the speed of light is only constant in a vacuum.

As a GPS signal passes through the charged particles of the ionosphere and then through the water vapor in the troposphere it gets slowed down a bit, and this creates the same kind of error as bad clocks.

There are a couple of ways to minimize this kind of error. For one thing we can predict what a typical delay might be on a typical day. This is called modeling and it helps but, of course, atmospheric conditions are rarely exactly typical.

Another way to get a handle on these atmosphere-induced errors is to compare the relative speeds of two different signals. This "dual frequency" measurement is very sophisticated and is only possible with advanced receivers.

Trouble for the GPS signal doesn't end when it gets down to the ground. The signal may bounce off various local obstructions before it gets to our receiver.

This is called multi path error and is similar to the ghosting you might see on a TV. Good receivers use sophisticated signal rejection techniques to minimize this problem.

Problems at the satellite

Even though the satellites are very sophisticated they do account for some tiny errors in the system.

The atomic clocks they use are very, very precise but they're not perfect. Minute discrepancies can occur, and these translate into travel time measurement errors.

And even though the satellites positions are constantly monitored, they can't be watched every second. So slight position or "ephemeris" errors can sneak in between monitoring times.

Intentional Errors!

As hard as it may be to believe, the same government that spent \$12 billion to develop the most accurate navigation system in the world intentionally degraded its accuracy. The policy was called "Selective Availability" or "SA" and the idea behind it was to make sure that no hostile force or terrorist group can use GPS to make accurate weapons.

Basically the DoD introduced some "noise" into the satellite's clock data which, in turn, added noise (or inaccuracy) into position calculations. The DoD may have also been sending slightly erroneous orbital data to the satellites which they transmitted back to receivers on the ground as part of a status message.

Together these factors made SA the biggest single source of inaccuracy in the system. Military receivers used a decryption key to remove the SA errors and so they're much more accurate.

Turning Off Selective Availability

On May 1, 2000 the White House announced a decision to discontinue the intentional degradation of the GPS signals to the public beginning at midnight. Civilian users of GPS are now able to pinpoint locations up to ten times more accurately. As part of the 1996 Presidential Decision Directive goals for GPS, President Clinton committed to discontinuing the use of SA by 2006. The announcement came six years ahead of schedule. The decision to discontinue SA was the latest measure in an on-going effort to make GPS more responsive to civil and commercial users worldwide.

The bottom line

Fortunately all of these inaccuracies still don't add up to much of an error. And a form of GPS called "Differential GPS" can significantly reduce these problems. We'll cover this type of GPS later.

To get an idea of the impact of these errors click [here](#) for a typical error budget.

Correcting Errors

1. The earth's ionosphere and atmosphere cause delays in the GPS signal that translate into position errors.
2. Some errors can be factored out using mathematics and modeling.
3. The configuration of the satellites in the sky can magnify other errors.
4. Differential GPS can eliminate almost all error.

Chapter 2

System Development

2.1 METHODOLOGY:

We started with initiating a team that would work together and then we decided on what we should work. Then we have to follow the SDLC process for system development.

2.1.1 Phase 1: Project Identification and Selection:

- Learn how the system should works.
- Review the system for solving prevailing drawbacks.
- Determine the requirements for the proposed system.
- Structure the system requirements using Context diagram, DFD's of different level.
- Build Conceptual Data modeling; build E-R Diagram (Entity Relationship Diagram).

2.1.2 Phase 2: Project Initiation and Planning:

2.1.2.1 Project Initiation:

- Build up the project initiation team
- Developing a plan to get the project started

2.1.2.2 Project Planning

- Defining clear, discrete activities and the work needed to complete each activity
- Make Baseline Project Plan (BPP)
 - ✓ Scope
 - ✓ Benefits

- ✓ Costs
- ✓ Risks
- ✓ Resources
- Outlines work needed to be performed
- High-level description of system
- Lists all work to be performed

2.1.2.3 Assessing Project Feasibility

- Economic
- Operational
- Technical
- Schedule

2.1.3 Phase 3: Analysis:

Gather information on what system should do from many sources. Information collected from users, Existing documents and files, Computer-based information, Understanding of organizational components, Business objective, Information needs, Rules of data processing, Key events, Gather facts, opinions and speculations, Be neutral, listen and Seek a diverse view, Problems with existing system, Opportunity to meet new need, Reasons for current system design, Prototyping, build rudimentary version of system is built, Quickly converts requirements to working version of system. Once the user sees requirements converted to system will ask for modifications or will generate additional requests.

2.1.4 Phase 4: System Design:

Design the logical database. Need to consider all inputs, outputs and every data element on the E-R Diagram. Finalize the prototyping that meet all the requirements. Based on that prototype design the physical database, use the

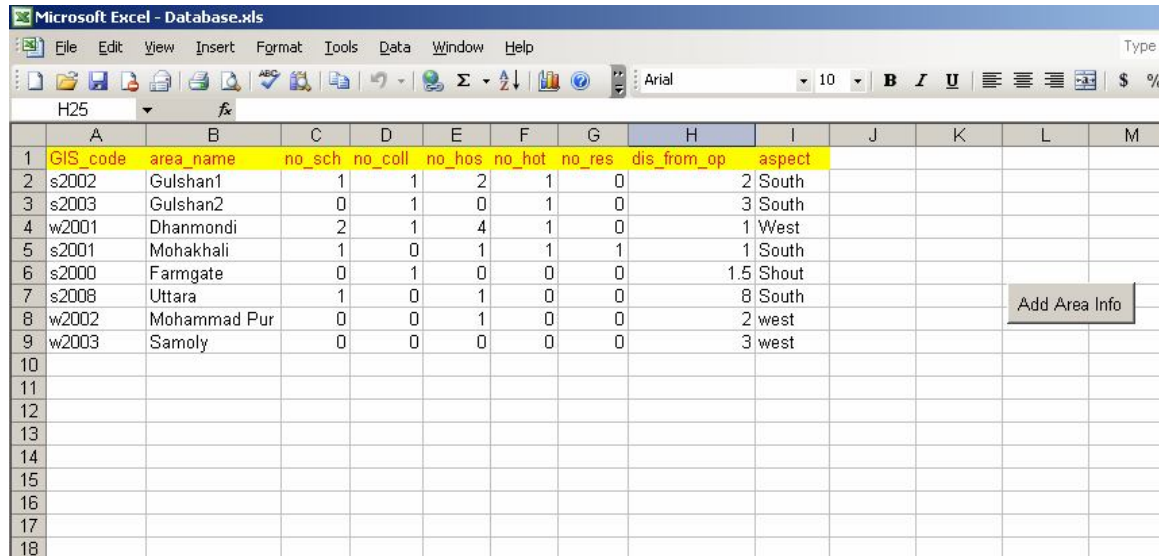
relational database model. Design the forms and reports. Finalize the Interfaces, Dialogues and design specification.

2.1.5 Phase 5: Implementation:

Code the system according to the design specification. Test the system and after the successful testing install the system. Prepare the Documentation for the System.

2.2 FINALIZED PROTOTYPE:

Fully workable prototype was build. Excel and its macro were used to quickly build a prototype. The prototype system is able to take message and also reply the message. Request from mobile phone is tested in the prototype. Format also completed in this stage



	A	B	C	D	E	F	G	H	I	J	K	L	M
	GIS_code	area_name	no_sch	no_coll	no_hos	no_hot	no_res	dis_from_op	aspect				
2	s2002	Gulshan1	1	1	2	1	0	2	South				
3	s2003	Gulshan2	0	1	0	1	0	3	South				
4	w2001	Dhanmondi	2	1	4	1	0	1	West				
5	s2001	Mohakhali	1	0	1	1	1	1	South				
6	s2000	Farmgate	0	1	0	0	0	1.5	Shout				
7	s2008	Uttara	1	0	1	0	0	8	South				
8	w2002	Mohammad Pur	0	0	1	0	0	2	west				
9	w2003	Samoly	0	0	0	0	0	3	west				
10													
11													
12													
13													
14													
15													
16													
17													
18													

Fig1: Area information

This is the excel sheet worked as a table for keeping the area information as well as the numbers of the schools, colleges etc. In this sheet we keep the name of areas and corresponding numbers of school, college, hospital, etc. found in the area.

	A	B	C	D	E	F	G	H	I
1	college_id	college_name	college_add	GIS_code	Full Address				
2	c101	Gulshan1 college	Gulshan1	s2002	Gulshan1 college, Gulshan1 college, Gulshan1 college	Add Information	Delete		
3	c102	Gulshan2 college	Gulshan2	s2003	Gulshan2 college, Gulshan2 college, Gulshan2 college,				
4	c103	Bangladesh Medical College	Dhanmondi	w2001	35, 14/A, Dhanmondi, Dhaka-1209, Bangladesh, Phone: 9118202/815843, Fax: 880-2-9125655				
5	c104	Tejgone College	Farmgate	s2000	Farmgate, Tejgone, Dhaka-1215				
6									
7									
8									
9									

Fig2: College information

This work sheet worked as a table for saving the information for the colleges. It will take the id for a college, its name, address, GIS code for that college etc. This sheet will help us when we need any information about colleges.

Microsoft Excel - Database.xls

File Edit View Insert Format Tools Data Window Help

A11

	A	B	C	D	E	F	G	H	I
1	hos_id	hos_name	hos_add	GIS_code	Full Address				
2	hos101	Gulshan1 Hospital	Gulshan1	s2002	Gulshan1 Hospital,100 00,Ph:12345 6789	Add Information	Delete		
3	hos102	Gana Shasthya Nagar Hospital	Dhanmondi	w2001	Dhanmondi, Dhaka5007 20, 8617208				
4	hos103	Bari-Ilizarov Orthopedic (BIO) Centre	Dhanmondi	w2001	Dhanmondi, Dhaka9120 309, 8117876				
5	hos104	I.R. Ltd.	Dhanmondi	w2001	Dhanmondi, Dhaka8618 085				
6	hos105	Z.H. Sikder Women's Medical College & Hospital	Dhanmondi	w2001	Dhanmondi, Dhaka8115 951, 8113313				
7	hos106	Aysha Memorial Specialized Hospital	Mohakhali	s2001	Mohakhali, Dhaka9122 689-90				
8	hos107	Modern Clinic of Surgery & Midwifery	Gulshan1	s2002	Gulshan, Dhaka,9883 948,603388, 602007				
9	hos108	Uttara Central Hospital	Uttara	s2008	Uttara, Dhaka,8911 551				
	hos109	Dushtha Shasthya Hospital	Mohammad Pur	w2002	Mohammadpur, Dhaka,8124				

Area Info College Hospital Hotel School Restaurant Help Type Topic Reseved Part Snding Part Interface

Ready

Fig3: Hospital information

This work sheet is working as a table for saving the information for hospitals. It will take the id for a hospital, its name, address, GIS code, its area etc. This will help us to find a hospital in an area.

Microsoft Excel - Database.xls

File Edit View Insert Format Tools Data Window Help

F23

	A	B	C	D	E	F	G	H	I	J
1	hot_id	hot_name	hot_add	GIS_code	Full Address					
2	hot101	Hotel Zakaria	Mohakhali	s2001	Mohakhali-1212, Ph:4598763	Add Information				
3	hot102	Ambala	Dhanmondi	w2001	Plot# 39, Road # 2, Dhanmondi Res. Area Dhaka-1205. Bangladesh					
4	hot103	Civic Inn	Gulshan2	s2003	House # 4B, Road # 67, Gulshan-2					
5	hos104	Hotel De Crystal crown	Gulshan1	s2002	House # 5, Road # 23/A, Gulshan-1 Dhaka-1212, Bangladesh					
6										
7										
8										
9										
10										
11										

Fig4: Hotel information

This work sheet worked as a table for saving the information for the hotel. It will take the id for a hotel, its name, the address, GIS code etc. Hotel queries will be solved by this sheet.

Microsoft Excel - Database.xls

File Edit View Insert Format Tools Data Window Help

Arial 10 B I U

D4 s2001

	A	B	C	D	E	F	G	H	I	J
1	sch_id	sch_name	sch_add	GIS_code	Full Address					
2	s101	Cambridge Int'l School	Dhanmondi	w2001	80, 7/A, Dhanmondi, Dhaka-1205, Bangladesh, Phone: 9114228/804 807					
3	s102	Dhanmondi Int'l School	Dhanmondi	w2001	51, 1, Dhanmondi, Dhaka-1212, Bangladesh, Phone: 884973, Fax: 880-2-835910					
4	s103	Genetic Computer School	Mohakhali	s2001	5, Mohakhali C/A, Dhaka-1212, Bangladesh, Phone: 8810370-72, Fax: 880-2-8810373					
5	s104	London International School	Gulshan1	s2002	Gulshan Branch : House # 11, Road # 6, Gulshan Dhaka 9118927, 8114967					
		London			Uttara Branch : House # 8,					

Area Info College Hospital Hotel **School** Restaurant Help Type Topic Reserved Part Sending Part Interface

Ready

Fig5: School information

This work sheet worked as a table for saving the information for the school. It will take the id for a school, its name, the address, GIS code etc. Schools can be found by this sheet.

	A	B	C	D	E	F	G	H	I	J
	res_id	res_name	res_add	GIS_code	Full Address					
1	res101	Parjatan Restaurant	Mohakhali	s2001	Mohakhali C/A,Dhaka-1212,Bangladesh,Phone: 607085-89					
2										
3										
4										
5										
6										
7										
8										
9										
10										

Fig6: Restaurant information

This work sheet worked as a table for saving the information for the restaurant. It will take the id for a restaurant, its name, the address, GIS code etc.

	A	B	C	D	E	F	G	H
	res_no	time_date	help_type	type	GIS_code	Done		
1	152447753	4/15/2003	1:46:10 AM	Hospital	Gulshan1	1		
2	179113560	4/15/2003	1:48:21 AM	Hospital	Mohakhali	1		
3	179113560	4/15/2003	1:48:43 AM	Hospital	Gulshan1	1		
4	179113560	5/23/2006	12:31:34 PM	Hospital	Uttara	1		
5	1199104391	5/23/2006	12:34:29 PM	College	Farmgate	1		
6	179113560	6/18/2006	2:26:36 PM	school	Dhanmondi	1		
7								
8								
9								
10								
11								
12								
13								

Fig7: SMS receiver

This work sheet worked as a table for receiving the SMS from the subscriber. Here it will take the subscriber number, time and date altogether, the help type

like school or hospital. The other field is used as a flag whether the SMS has been replied or not.

	A	B	C	D	E	F	G
1	send_no	time_date	GIS_code	data	Done		
2	152447753	5/23/2006 12:30:36 PM	Gulshan1	Gulshan1 Hospital Gulshan1 Hospital,10000,Ph:123456789	1		
3	179113560	5/23/2006 12:30:36 PM	Mohakhali	Aysha Memorial Specialized Hospital Mohakhali, Dhaka9122689-90	1		
4	179113560	5/23/2006 12:31:10 PM	Gulshan1	Gulshan1 Hospital Gulshan1 Hospital,10000,Ph:123456789	1		
5	179113560	5/23/2006 12:31:35 PM	Uttara	Uttara Central Hospital Uttara, Dhaka,8911551	1		
6	1199104391	5/23/2006 12:34:30 PM	Farmgate	Tejgona College Farmgate,Tejgona,Dhaka-1215	1		
7	179113560	6/18/2006 2:28:50 PM	Dhanmondi	Cambridge Int'l School 80, 7/A, Dhanmondi,Dhaka-1205,Bangladesh,Ph:	1		
8							
9							
10						Send	
11							
12							
13							

Fig8: SMS sender

This worksheet works as the table which will store the reply message. It will store the subscriber number, time and date, the GIS code, and the data set which will be send to the subscriber. The other field is used for flag which will show that whether the SMS has been sent or not.

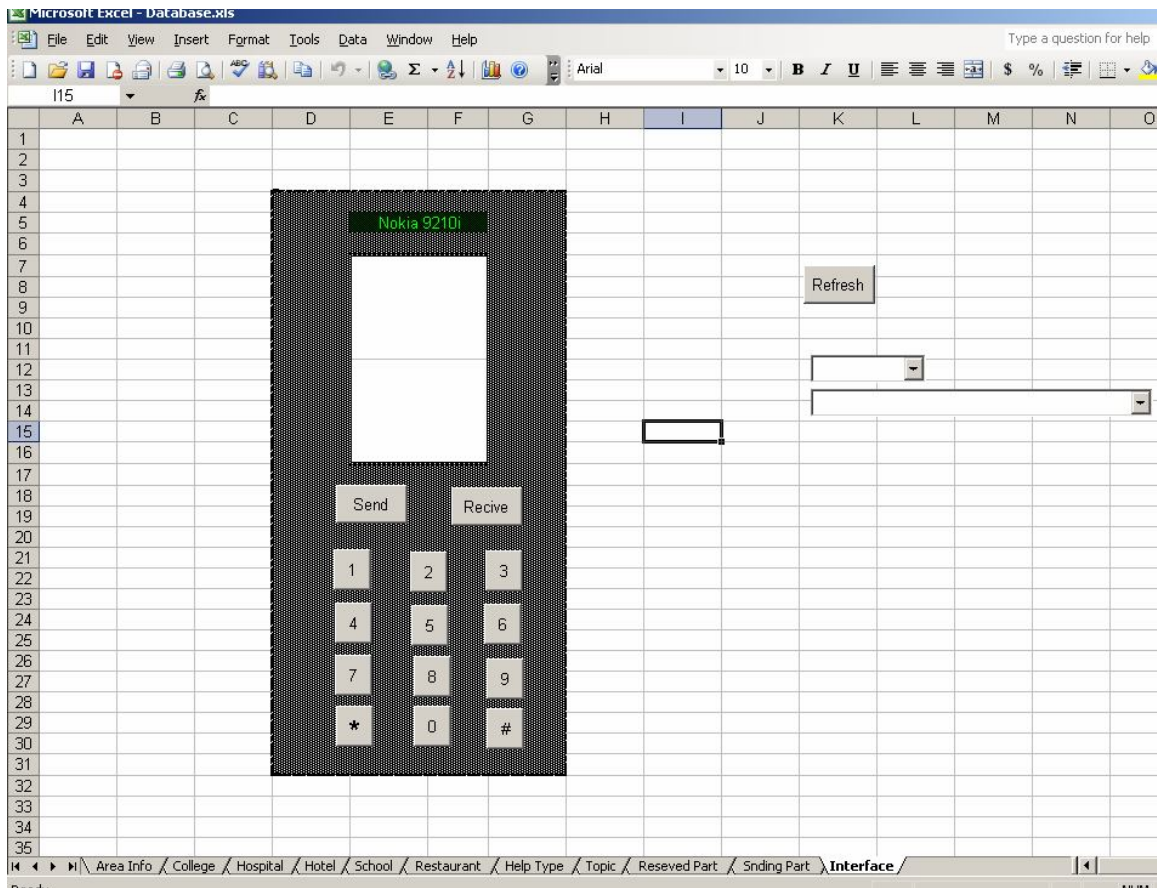


Fig9: Mobile Interface

This is the interface of mobile which is used for sending the SMS and as well as for receiving also. It means it is symbolizing the user mobile who will send a request.

2.3 BLOCK DIAGRAM OF THE OVERALL SYSTEM

The figure below is showing the block diagram that main server will contain the information about the quarries and the receiver server will receive the request and the sender server will send the information about the request.

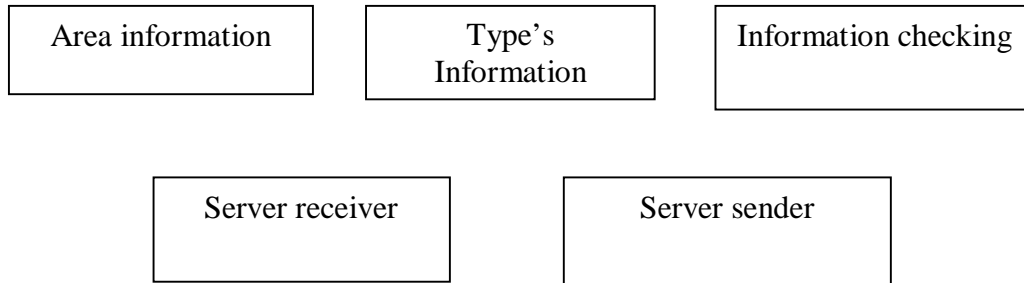


Fig10: **Block diagram of overall system**

Chapter 3

SYSTEM BUILDING

One of the important parts is to build the system so that it would be user friendly and handy. The system that will receive the SMS, check it whether the format is correct or not, preparing the data that will send to the sender.

3.1 Building the system:

For making the system handy, we choose the format like: the subscribers only have to send the topic only like hospital, school etc. and the GPS will track the GIS code. The server will get the data as the subscriber's phone number, the time and date, help topic, the GIS code.

It will take the help topic and check for the format and then it will go to the desired department to get the data. If it can find out the desired data then it will make the data as how many destinations has found and their name as a list. If no resources are available then it will try to find out the resources nearby the area. If there are some result found then it will send that but not found then it will simply send "no resources are found in your area or near your area".

3.2ContextDiagram:

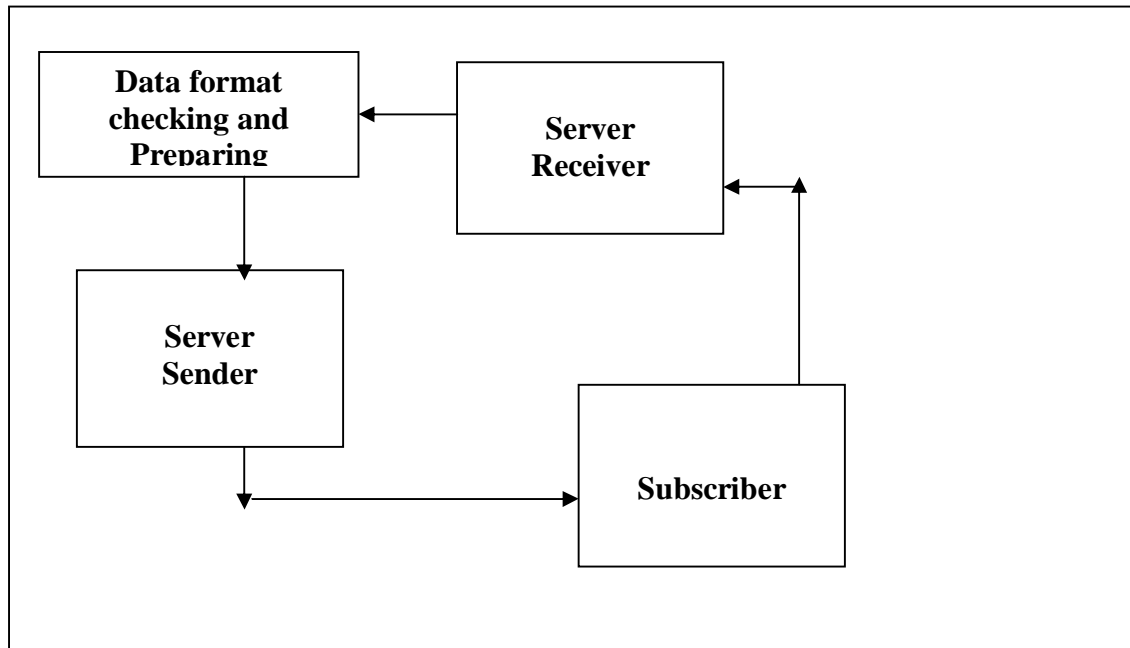


Fig11: Context Diagram

The subscriber sends request to the server and the server will check and prepare the data according to request and then server will send the data as SMS to the subscriber.

3.3DFD (The data flow diagram):

After subscriber send a request the receiver will receive it then it will be checked for format to prepare for request after that it will be send to server to deliver to the subscriber.

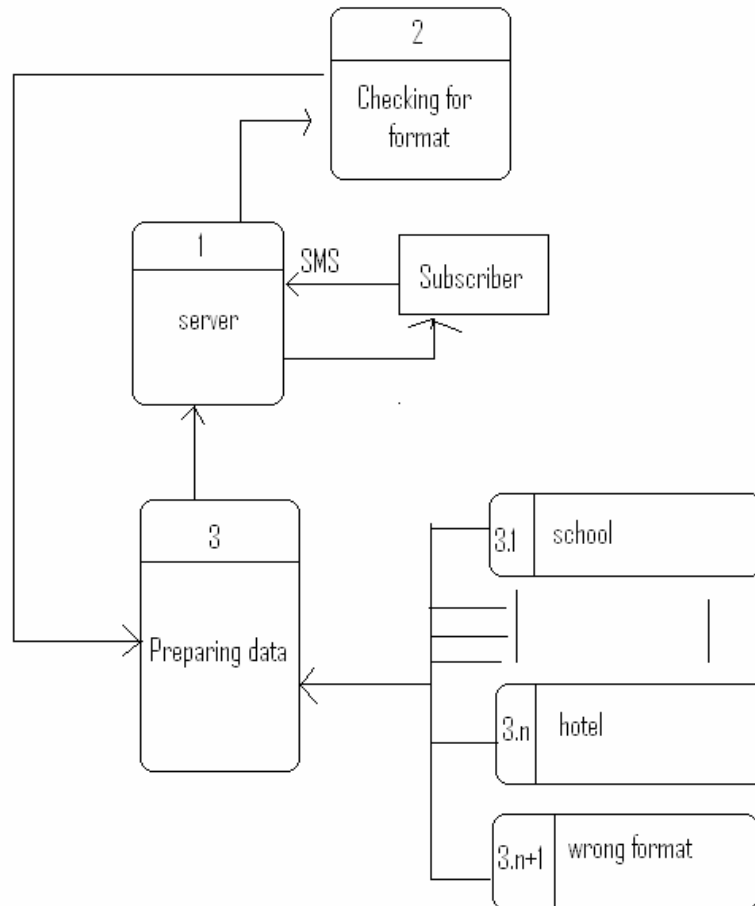


Fig12: The data flow diagram

3.3.1. The Zero level DF diagram decomposition:

The zero level DFD decomposition says that the system will take The SMS from the subscriber and reply it. Here the SMS will show the request only. When the request is recorded then the first level Data flow will begin.

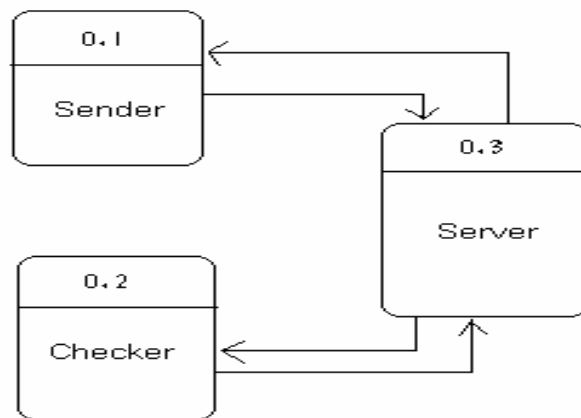


Fig13: The zero level diagrams

3.3.2. The level One DF diagrams decomposition:

Level one will do the checking part and will prepare the data. Here it will check the format and if the format is correct then it will open the desired table, and search for the data and prepare it to send. If not found then it will search for the data near the area and send the data if found but if not found the data then it will show the result like “No resources are available in your area or near your area.”

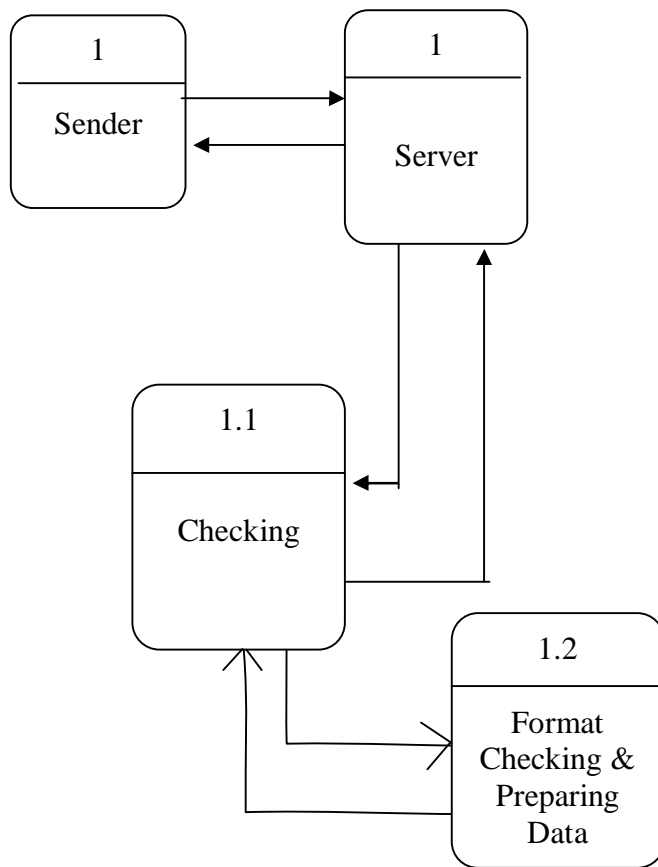


Fig14: level 1 decomposition

3.3.3 The level Two DF diagrams decomposition:

The second level data flow diagram shows how the data checking is happened and then how the output will come. First it loads all the help types like school; college etc. if it doesn't get a match then it returns that "wrong data type", otherwise it goes to the desired part or table.

Now when it loads the table then it takes the subscribers area code from GIS code and try to get a match with every data set and count how many data sources it had found and show it but if it doesn't get any data in the requested area then it searches near of the area and do the same work above. And finally it returns the data as text and sends it to the subscriber.

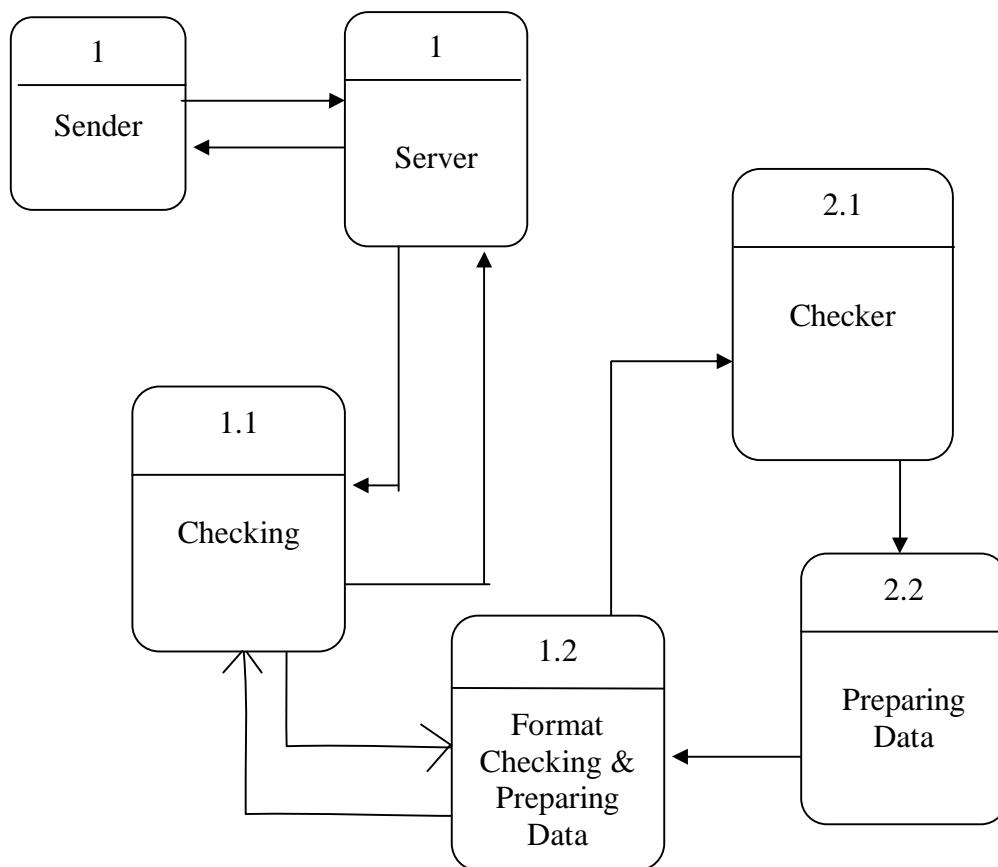


Fig15: Level 2 decomposition

3.4 Entity Relationship Diagram:

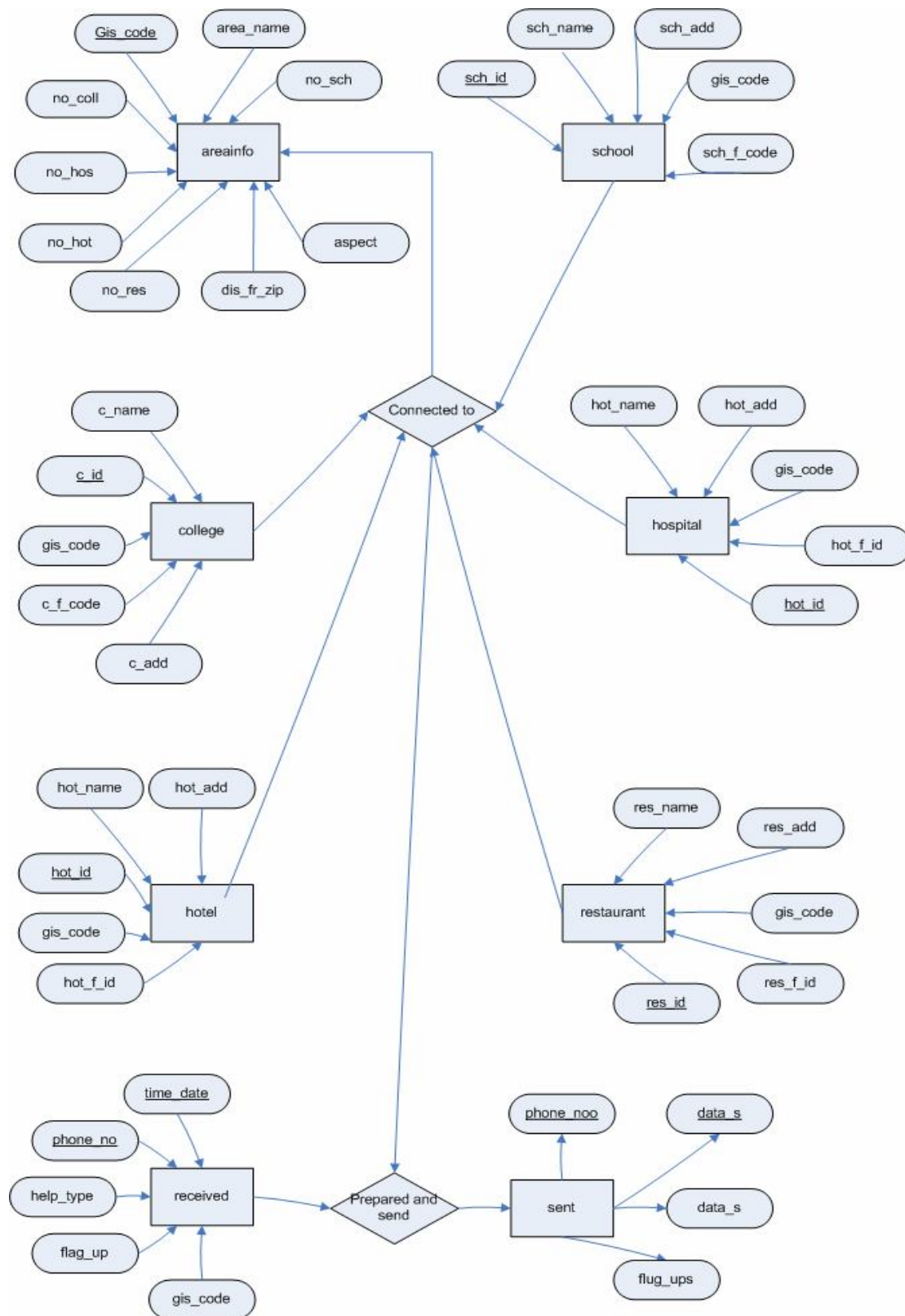


Fig16: entity relationship diagram

3.5 Description of Demo Software:

This is the switchboard where the operator will choose where to go. The “Area Info” button is to go and watch and as well as add the information about the areas. The button “Fundamental Needs” is to go to that form where all the information about school, college etc. are stored. We can as well as add data in there. The “Server” button goes to the server part where the SMS will be stored and prepare the data for sending to the subscriber.

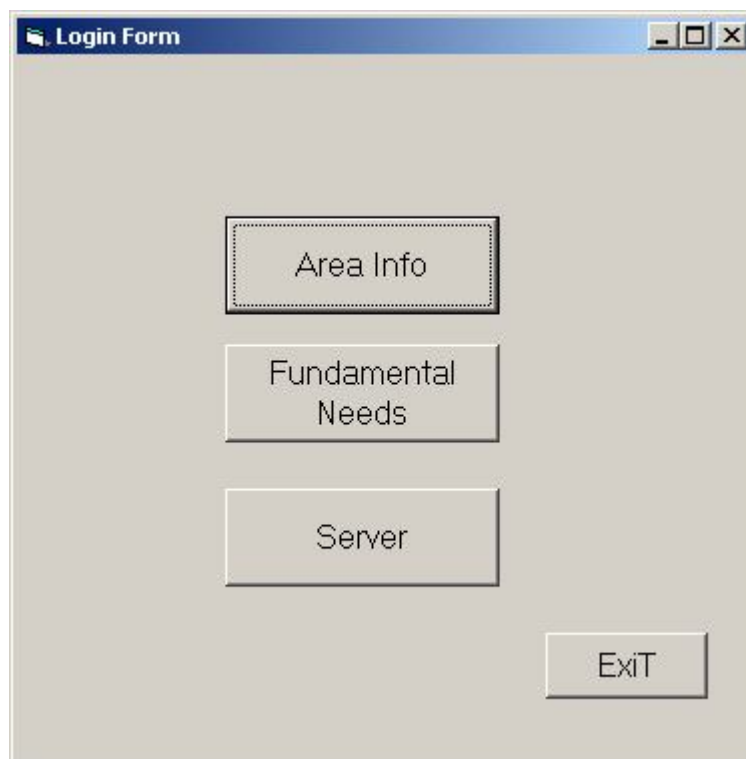


Fig17: Switchboard

The area information window shows the information about the areas like the GIS code of the area, the name, number of colleges, schools, restaurant etc., distance from zero point and aspect. This window is a dynamic page where the updates will show dynamically. Like when we will add a school under any area then the number of school will increase automatically.

Query									
	GIS Code	Area Name	School	College	Hospital	Hotel	Restarent	Distance	Aspect
	s2002	Gulshan1	2	1	0	1	1	2	south
	s2003	Gulshan2	0	1	1	1	0	3	south
	w2001	Dhanmondi	1	0	1	1	0	1	west
	s2001	Mohakhali	5	1	1	1	3	1	south
	s2000	Farmgate	1	0	0	0	0	2	south
	s2008	Uttara	0	0	1	0	0	8	south
	w2002	Mohammad	0	0	0	0	0	2	West
	w2003	Shamoly	0	1	0	0	0	3	West
	w2008	Mirpur	0	0	0	0	0	8	West
	w2007	Kaji Para	0	0	0	0	0	7	West
	w2006	Shaorapara	0	0	0	0	0	6	West

Add
Load
Back

Fig18: Area Info.

This page will show the records of individual school college etc. Here the menu bar will take the option to show the records and to add any other records.

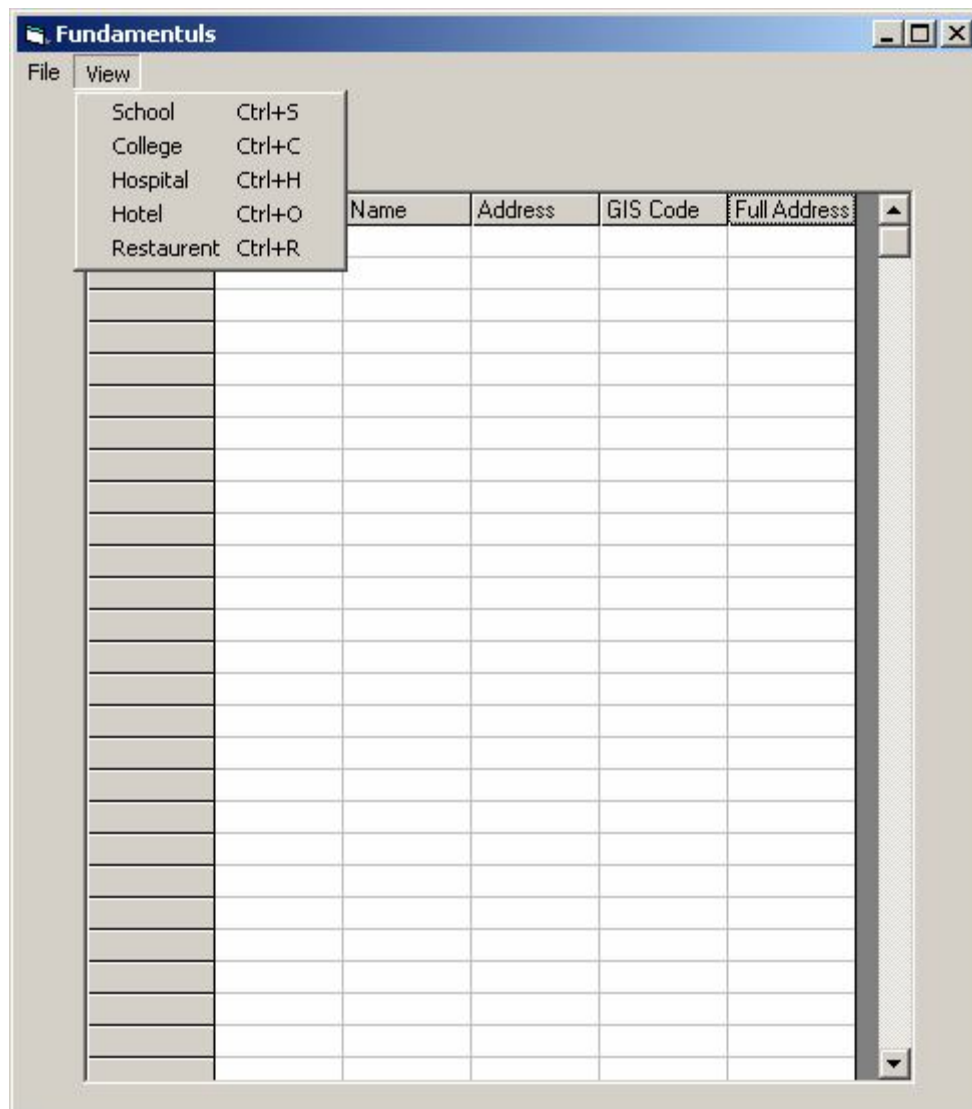
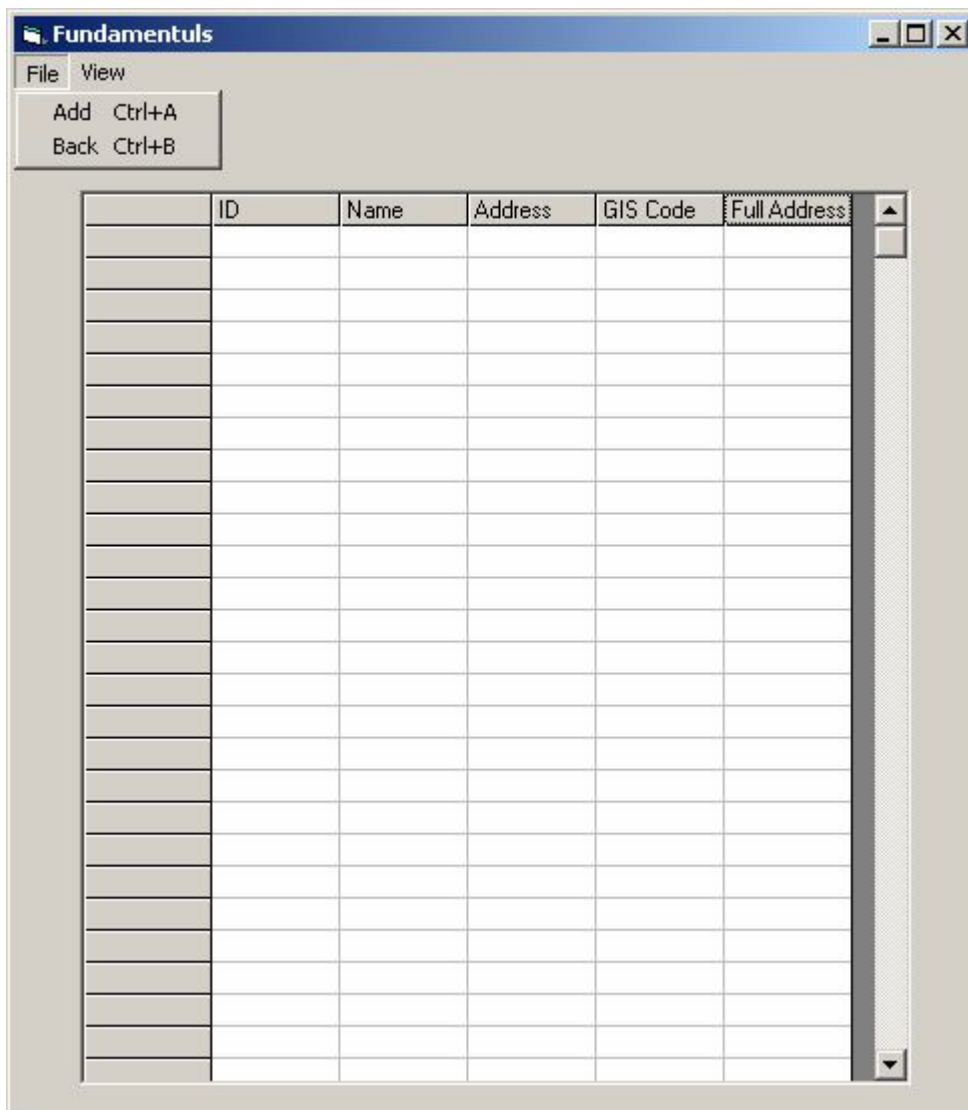


Fig19: Record Place

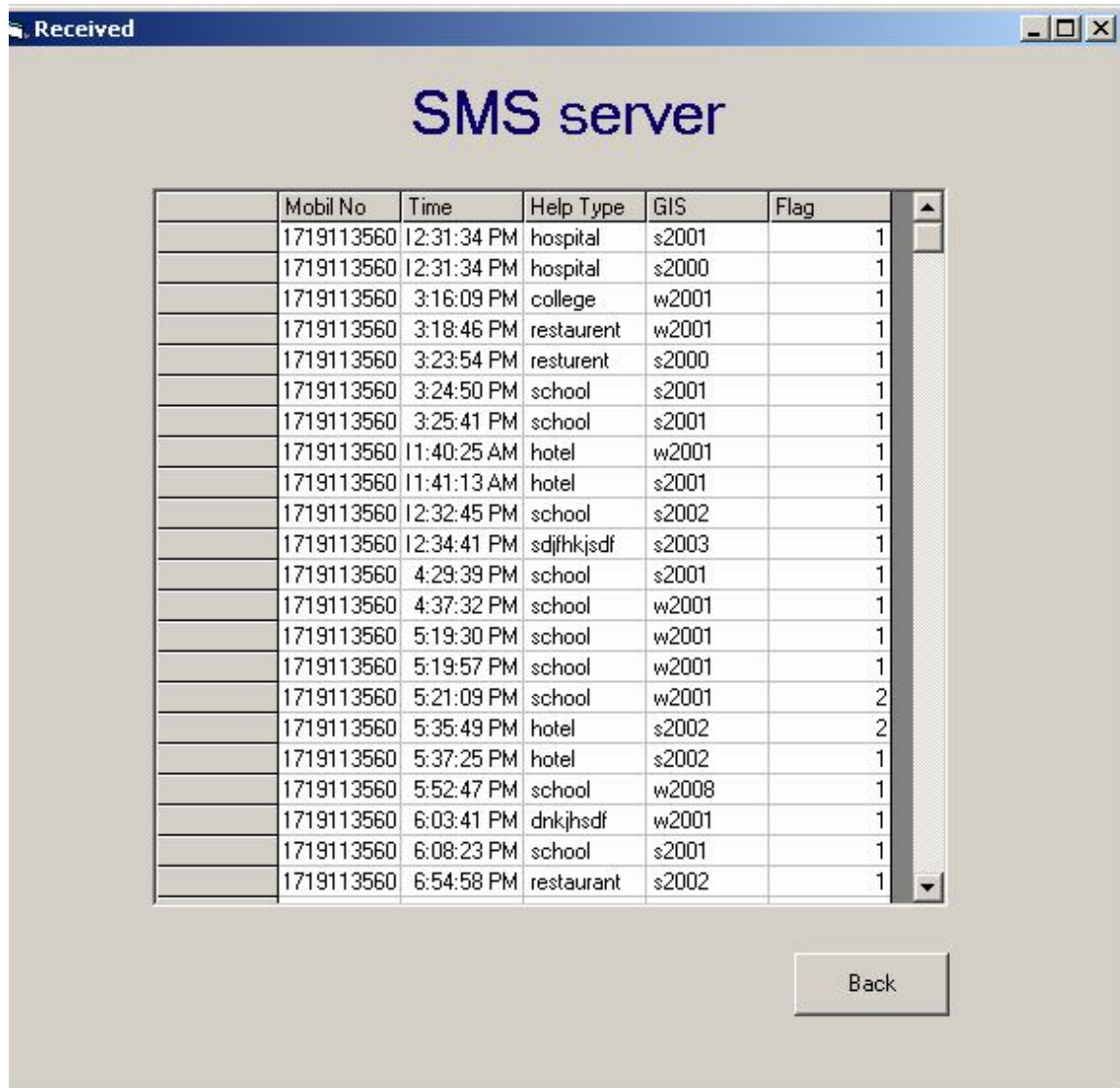


The screenshot shows a window titled "Fundamentuls" with a menu bar containing "File" and "View". Below the menu bar, there are two buttons: "Add" (with a keyboard shortcut of Ctrl+A) and "Back" (with a keyboard shortcut of Ctrl+B). The main area of the window contains a table with the following columns: ID, Name, Address, GIS Code, and Full Address. The table has 20 rows, all of which are currently empty. A vertical scrollbar is visible on the right side of the table.

	ID	Name	Address	GIS Code	Full Address

Fig20: Add Place

This is the main server page where the SMS will be received and will return to the subscriber. This page is automated and dynamic so that no body has to sit there and have to do anything for helping to reply. The system will receive the SMS entry and will reply it automatically.



Mobil No	Time	Help Type	GIS	Flag
1719113560	12:31:34 PM	hospital	s2001	1
1719113560	12:31:34 PM	hospital	s2000	1
1719113560	3:16:09 PM	college	w2001	1
1719113560	3:18:46 PM	restaurent	w2001	1
1719113560	3:23:54 PM	resturent	s2000	1
1719113560	3:24:50 PM	school	s2001	1
1719113560	3:25:41 PM	school	s2001	1
1719113560	11:40:25 AM	hotel	w2001	1
1719113560	11:41:13 AM	hotel	s2001	1
1719113560	12:32:45 PM	school	s2002	1
1719113560	12:34:41 PM	sdjfhkjsdf	s2003	1
1719113560	4:29:39 PM	school	s2001	1
1719113560	4:37:32 PM	school	w2001	1
1719113560	5:19:30 PM	school	w2001	1
1719113560	5:19:57 PM	school	w2001	1
1719113560	5:21:09 PM	school	w2001	2
1719113560	5:35:49 PM	hotel	s2002	2
1719113560	5:37:25 PM	hotel	s2002	1
1719113560	5:52:47 PM	school	w2008	1
1719113560	6:03:41 PM	drnkjhdsf	w2001	1
1719113560	6:08:23 PM	school	s2001	1
1719113560	6:54:58 PM	restaurant	s2002	1

Fig21: SMS server

3.6Tables:

Area info table contain this things:

<u>gis_code</u>	area_name	no_sch	no_coll	no_hos	no_hot	no_res	dis_fr_zp	aspect
-----------------	-----------	--------	---------	--------	--------	--------	-----------	--------

College table contains these values:

<u>c_id</u>	c_name	c_add	gis_code	c_f_add
-------------	--------	-------	----------	---------

School table contains these values:

<u>sch_id</u>	sch_name	sch_add	gis_code	sch_f_add
---------------	----------	---------	----------	-----------

Hotel table contains these values:

<u>hot_id</u>	hot_name	hot_add	gis_code	hot_f_add
---------------	----------	---------	----------	-----------

Hospital table contains these values:

<u>hos_id</u>	hos_name	hos_add	gis_code	hos_f_add
---------------	----------	---------	----------	-----------

Restaurant table contains these values:

<u>res_id</u>	res_name	res_add	gis_code	res_f_add
---------------	----------	---------	----------	-----------

Chapter 4

System Environment

As the system is automated so the operator has to run the system and add any area or school or college etc., records. The other things will be done automatically.

The users' Server PC should have to meet some requirements:

1. Pentium II
2. RAM 64mb
3. Oracle 8i
 - a. SQL – For making the table and use it in the front end.
4. Visual Basic 6.0
 - a. ADODB record set – this has been used for getting the SQL table and as well the query.
 - b. Microsoft Active-X SMS object - for connecting the mobile with the interface.
 - c. Microsoft Library 2.1 – this was used for connection with the Oracle SQL and Visual Basic 6.0.
5. Mobile Modem
 - a. Used for making the connection between the server and the mobile.

Chapter 5

Conclusion and future scopes

Our goal was to make a system that will help people and we have built a system that will work but in our country most of the GSM set is not GPS enable so that we can not implement here as long as the Govt. don't give us the permission to use the GPS and GPS enable set publicly. But in our country most of the people uses internet or wap in there cell phone. So we want to make a wap site that will not only able to show the information but also show the destination graphically.

Chapter 6:

References:

- www.gpstecnology.com
- www.satelite.com/gps.htm
- www.bbc.com
- <http://www.literature.org>
- www.ancbooks.com
- <http://freebooks.50webs.com/>